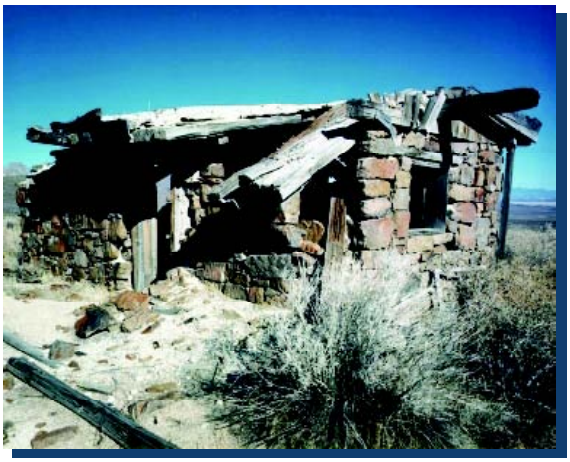
Environmental Restoration

Tonopah Test Range

History



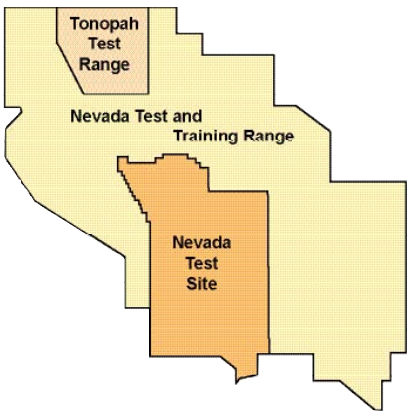
High in the Great Basin desert, midway between Reno and Las Vegas, lies the Tonopah Test Range (TTR). Nestled amongst the Cactus and Kawich mountains, TTR, which encompasses 525 square miles within the boundaries of the Nevada Test and Training Range has a unique history clad with pioneers of all types – including miners, ranchers, and engineers – who came to the area hoping to make the most of the available natural resources.

TTR's features attracted field testing managers from Sandia National Laboratories in the 1950s for several reasons: the desert valley's dryness left clear pathways for tracking aircraft and airborne weapons; as well as preventing growth of dense vegetation that would obscure views of bomb impacts. The sparse vegetation also limits the amount of wildlife in the area. In addition, the mountain ranges delineated a north-south flight path, assuring that secret testing could be conducted safely and securely.

In 1956, the Atomic Energy Commission, predecessor to the U. S. Department of Energy (DOE), began testing weapons, research rockets, and artillery on the TTR. As a result of these tests, contaminants have been introduced to parts of the range. Contaminants include unexploded ordnance, heavy metals, pesticides, total petroleum hydrocarbons and other hazardous material. Additionally, some sites contain radioactive and mixed waste.

The introduction of contaminants has created environmental concerns. In response to these concerns, the Environmental Restoration Division of the U.S. Department of Energy National Nuclear Security Administration Nevada Site Office (NNSA/NSO) is remediating the TTR. This includes all surface and shallow subsurface soil contamination resulting primarily from historical nuclear safety tests. Workers conduct studies and surveys, called site characterization, to determine the type and extent of contamination. They also examine the potential risk to the public and the environment. Based on these studies, scientists determine the best options to address the contamination.

Before any cleanup activities begin Preliminary Assessments (PA) are conducted at the TTR such as geophysical surveys, which measure the characteristics of the earth's upper surface. These surveys enable scientists to locate underground storage tanks and sumps, trace pipes and cables, define leachfields and septic tanks, and map landfill boundaries.



During the PA an inventory of the contaminated sites is conducted to assist in developing a work plan. As part of the inventory, scientist collect historical information, interpret aerial and ground photographs, and review engineering drawings. Scientists also conduct aerial surveys from helicopters with radiation detection equipment. These surveys map the general location and concentration of radioactive soil debris from testing activities. Ground survey crews then mark the locations, and the contaminated areas are identified as environmental restoration sites to be remediated by either the Industrial Sites Project or the Soils Project.

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Tonopah Test Range

Industrial Sites Project

Based on the information gathered during the preliminary assessment, the Industrial Sites Project decides the order in which to characterize and remediate sites. The sites are called Corrective Action Sites (CAS) and are chosen based on the type of hazard present, risk to people and the environment, availability of funding, and types of technologies available to conduct characterizations and expedite remediation.

The types of remediation activities are grouped as follows:

- *Inactive Tanks* previously used for underground storage of fuel and other liquids
- *Contaminated Waste Sites* previously used as landfills and construction debris disposal areas;
- *Septic Tanks and Lagoons* previously used to contain sewage, but also included such contaminants as antifreeze, motor oil, paint and solvents;
- *Drains and Sumps* previously used as underground discharge points for liquid waste; and
- *Ordnance Sites* previously used for aerial drops of bombs or pods containing hundreds of cluster bomblets.

A total of 66 Corrective Action Sites (CASs) are located on the TTR. Fifty five of these have been closed and approved by the State of Nevada. Eleven CASs remain to be remediated, of which ten are in progress and one is waiting to be started. The timeline calls for all 66 of the CASs to be remediated and the closure approved by 2013.

Soils Project

The soil contaminated on the TTR was generated by a joint exercise conducted in 1963 by the United Kingdom, the U. S. Department of Defense, and the Atomic Energy Commission called Operation Roller Coaster. The project was an experimental series of four non-nuclear detonations of nuclear devices designed to see if conventional explosives could accidentally set off nuclear weapons. The devices were detonated at sites designated as Double Tracks and Clean Slates I, II, and III. These tests proved that nuclear detonations would not occur. However, plutonium and uranium from these tests contaminated surface soil.

Although corrective action levels are being negotiated between the State of Nevada, the U.S. Air Force, and NNSA/NSO, the Soils Project has conducted interim corrective actions at Double Tracks and Clean Slate I. The sites were characterized and soil removal actions were performed. Clean Slate II and III, which were used for plutonium dispersal experiments, have been characterized.

Preparing for the Future

The work conducted by the Environmental Restoration division under Industrial Sites and Soils Projects continues to improve the facilities and the land at the TTR, ensuring the safety of workers and the environment. Due to the extensive characterization and remediation activities, the TTR remains an important resource for future missions.

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DOE/NV--1056
May 2005